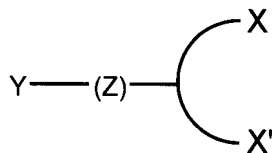
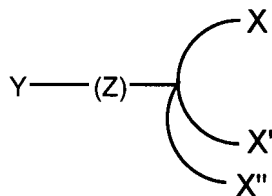


T0500



or



Page 13, line 18, replace "X" with --Y--.

In the Claims:

Cancel claims 27, 30 and 46-48 without prejudice.

Amend claims 1, 2, 6-8, 11, 18, 20, 21, 23, 25, 26, 29, 31-35, 37, 38, 40, 41, 43-45, 49-51

and 56-59 as follows:

1. (amended) A composition comprising:

a compound; and

a semiconductor nanocrystal [associated with] linked to the compound by a ligand of the formula $H_zX((CH_2)_nCO_2H)_y$ and salts thereof, where X is S, N, P or O=P; $n \geq 6$; and z and y are selected to satisfy the valence requirements of X, the nanocrystal having a characteristic spectral emission, wherein said spectral emission is tunable to a desired wavelength by controlling the size of the nanocrystal, and wherein said emission provides information about a biological state or event.

2. (amended) The composition of claim 1, wherein the nanocrystal further comprises:

a layer overcoating the semiconductor nanocrystal, the layer being comprised of a material having a band gap greater than that of the [quantum dot] semiconductor nanocrystal.

50

7. (amended) The composition of claim 1, wherein the biological event for which information is provided is selected from the group consisting of: an interaction between [interactions of] biological moieties, [alterations in structures of biological compounds] an alteration in structure of a biological compound, and [alterations in biological processes] an alteration in a biological process.

8. (amended) The composition of claim 1, wherein the [association of] link between the compound [to] and the nanocrystal is accomplished through an [association] association selected from the group consisting of covalent, noncovalent, hydrophobic, hydrophilic, electrostatic, magnetic [or] and coordination through a metal complex.

9. (amended) The composition of claim 1, wherein the [association of the compound to the nanocrystal is accomplished through a bridging ligand, said] ligand [having] includes a first end linked to the nanocrystal and a second end coupled to the compound.

11. (amended) The composition of claim 10, wherein the [compound is a] biological compound [selected from the group consisting of: proteins, peptides, nucleic acids, carbohydrates, cells, lipids, cellular organelles, signaling molecules] is a protein, a peptide, a nucleic acid, a carbohydrate, a cell, a lipid, a cellular organelle, or a signaling molecule.

18. (amended) The composition of claim 17, wherein the biological compound comprises [a] an oligonucleotide.

20. (amended) The composition of claim 17, wherein the biological compound is selected from the group consisting of: [ribonucleotides, deoxyribonucleotides, dideoxyribonucleotides] a ribonucleotide, a deoxyribonucleotide, a dideoxyribonucleotide and derivatives thereof.

21. (amended) The composition of claim 17, wherein the biological compound is selected from the group consisting of[;]: [single stranded nucleic acid, double stranded nucleic acids, and triple stranded nucleic acid clusters, Holliday junctions, circular single-stranded DNA, circular

D6
Cont.
double-stranded DNA, and DNA cubes] a single stranded nucleic acid, a double stranded nucleic acid, a triple stranded nucleic acid cluster, a Holliday junction, a circular single-stranded DNA, a circular double-stranded DNA, and a DNA cube.

D7
23. (amended) The composition of claim [1] 22, wherein the small molecule is biotin.

D8
25. (amended) The composition of claim 1, wherein the compound is [associated with] linked to the nanocrystal through a [bridging] bridging biotin:avidin complex.

26. (amended) The composition of claim 1, wherein the compound is [associated with] linked to the nanocrystal through a bridging biotin:streptavidin complex.

28
27. (amended) The composition of claim [27] 1, wherein the [water-soluble] nanocrystal comprises:

D9
a [quantum dot] semiconductor material having a selected band gap energy;
a layer overcoating the [quantum dot] semiconductor material, the overcoating layer comprised of a material having a band gap energy greater than that of the [quantum dot] semiconductor material ; and
an outer layer, the layer comprising the ligand, the [a] ligand having at least one linking group for attachment of the compound to the overcoating layer and at least one hydrophilic group spaced apart from the linking group by a hydrophobic region sufficient to prevent electron charge transfer across the hydrophobic region.

28
29. (amended) The composition of claim 29, wherein the linking group comprises a moiety selected from the group consisting of [amines, thiols, phosphines, phosphine oxides, and amine oxides] an amine, a thiol, a phosphine, a phosphine oxide, and an amine oxide.

D10
30
32. (amended) The composition of claim 29, wherein the hydrophilic group is selected from the group consisting of carboxylic acid, carboxylate [(-CO₂⁻)], sulfonate [(SO₃⁻)], hydroxide

52

[(-OH)], [alkoxides] alkoxide, ammonium [salts] salt [(-NH₄⁺)], and phosphate [(-PO₄⁻² and -PO₃⁻²)].

D¹⁰
cont.
33. (amended) The composition of claim 1, wherein a plurality of [the nanocrystal] nanocrystals exhibit [exhibits] less than a 10% rms deviation in diameter [of the quantum dot].

34. (amended) The composition of claim 1, wherein a plurality of [compositions exhibits a spectral range that is] nanocrystals exhibit an emission spectrum having a linewidth of less than about 40 nm at full width at half maximum (FWHM).

35. (amended) The composition of claim 1, wherein a plurality of [compositions exhibits] nanocrystals exhibit an emission spectrum having a linewidth of a spectral range that is less than about 25 nm at full width at half maximum (FWHM).

D¹¹
31. (amended) The composition of claim ~~29~~²⁸, wherein the nanocrystal exhibits photoluminescence having a quantum [yields] yield of greater than 10% in water.

32. (amended) The composition of claim ~~29~~²⁸, wherein the nanocrystal exhibits photoluminescence having a quantum [yields] yield in the range of about 10-30% in water.

D¹²
33. (amended) The composition of claim 1 or ~~29~~²⁸, wherein the nanocrystal is a ZnS overcoated CdSe nanocrystal.

39. (amended) The composition of claim 1, wherein the nanocrystal has a narrow spectral emission range selected from the spectrum in the range of about 300 nm to about 1500 nm.

D¹³
41. (amended) The composition of claim 1, wherein the compound is [associated with] linked to the [water soluble] nanocrystal by means of covalent attachment.

53

D¹³
cont.
42
44. (amended) The composition of claim 1, wherein the compound is [associated with] linked to the [water soluble] nanocrystal directly through a thiol or an amine group coordinated to the semiconductor nanocrystal.

43
45. (amended) The composition of claim [30] 1, wherein the compound is [associated with] linked to the nanocrystal by means of covalent coupling of a carboxylic acid moiety with an amine group of the compound.

D¹⁴
44
49. (amended) A composition comprising:
a semiconductor nanocrystal having a selected band gap energy;
an overcoating layer disposed on the semiconductor nanocrystal, the overcoating layer comprised of a material having a band gap energy greater than that of the semiconductor nanocrystal;
an outer layer disposed about the overcoating layer, the outer layer comprising a plurality of ligands, each having at least one linking group for attachment of the ligand to the overcoating layer and at least one hydrophilic group spaced apart from the linking group by a hydrophobic region sufficient to prevent electron charge transfer across the hydrophobic region; and
a compound [associated with] linked to the overcoating layer, the nanocrystal exhibiting photoluminescence having a quantum yield of greater than 10% in water.

D¹⁵
45
50. (amended) The composition of claim 49, wherein the compound is [associated with] linked to the overcoating layer via a ligand of the outer layer.

46
45
51. (amended) The composition of claim 50, wherein the compound is [associated with] linked to the hydrophilic group of the ligand.

D¹⁶
47
56. (amended) A water-soluble composition comprising:
a water-soluble semiconductor nanocrystal having a selected band gap energy; and
a compound [associated with] linked to the semiconductor nanocrystal, wherein the

54

water-soluble semiconductor nanocrystal exhibits photoluminescence having a quantum yield of greater than 10% in water.

60
57. (amended) The composition of claim 56, wherein the water-soluble semiconductor nanocrystal further includes a ligand of the formula, $H_zX((CH_2)_nCO_2H)_y$ and salts thereof, [associated with] linked to the water-soluble semiconductor nanocrystal, wherein X is S, N, P or O=P; $n \geq 6$; and z and y are selected to satisfy the valence requirements of X.

69
58. (amended) A water-soluble composition comprising:
a water-soluble semiconductor nanocrystal having a selected band gap energy; and
a compound [associated with] linked to the semiconductor nanocrystal, wherein the water-soluble semiconductor nanocrystal exhibits photoluminescence having a quantum yield between about 10-30% in water.

70
59. (amended) A composition comprising:
a semiconductor nanocrystal having a selected band gap energy, wherein the semiconductor nanocrystal includes a ligand of the formula, $H_zX((CH_2)_nCO_2H)_y$ or a salt thereof, where X is S, N, P or O=P; $n \geq 6$; and z and y are selected to satisfy the valence requirements of X; and
a compound [associated with] linked to the semiconductor nanocrystal.

Please add new claims 62-77 as follows.

51
62. (New) The composition of claim 49 or 50, wherein the compound and the nanocrystal are disposed through an association selected from the group consisting of covalent, noncovalent, hydrophobic, hydrophilic, electrostatic, magnetic and coordination through a metal complex.

52
63. (New) The composition of claim 49 or 50, wherein the ligand includes a first end linked to the nanocrystal and a second end coupled to the compound.

55

⁵³
~~64.~~ (New) The composition of claim ~~54~~ or ~~55~~, wherein compound is a biological compound.

⁵⁴
~~65.~~ (New) The composition of claim ~~64~~, wherein the biological compound is a protein, a peptide, a nucleic acid, a carbohydrate, a cell, a lipid, a cellular organelle, or a signaling molecule.

⁵⁵
~~66.~~ (New) The composition of claim ~~65~~, wherein the biological compound comprises a protein.

⁵⁶
~~67.~~ (New) The composition of claim ~~66~~, wherein the protein comprises an antibody.

⁵⁷
~~68.~~ (New) The composition of claim ~~67~~, wherein the protein comprises avidin or streptavidin.

⁵⁸
~~69.~~ (New) The composition of claim ~~68~~, wherein the biological compound comprises a nucleic acid.

⁵⁹
~~70.~~ (New) The composition of claim ~~69~~, wherein the biological compound is selected from the group consisting of: a ribonucleotide, a deoxyribonucleotide, a dideoxyribonucleotide and derivatives thereof.

⁶⁰
~~71.~~ (New) The composition of claim ~~54~~ or ~~55~~, wherein the compound is biotin.

⁶¹
~~72.~~ (New) The composition of claim ~~54~~ or ~~55~~, wherein the compound is linked to the nanocrystal through a bridging biotin:avidin complex.

⁶²
~~73.~~ (New) The composition of claim ~~54~~ or ~~55~~, wherein the compound is linked to the nanocrystal through a bridging biotin:streptavidin complex.